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Phenotypic correlations between linear type conformation traits, production and fertility in a once-a-day milked dairy cattle herd

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ABSTRACT

There is widespread adoption of OAD milking of dairy cattle in New Zealand, and to maximize the benefits, selection of animals which function well on this system is necessary. Selection can be facilitated through the use of linear type trait scoring in the selection procedure and this study aimed to quantify the correlations between the linear type traits and economically important traits in an OAD milked herd. Jersey cows in this study had lower mean scores for the body type traits, milk and protein yield and lactation length, but similar udder type scores, somatic cell score, fat yield and fertility performance compared with Holstein-Friesian and crossbred cows. The phenotypic correlations between individual body type traits were positive and strong, and likewise between individual udder type traits, however, between the two groups, the phenotypic correlations were weak and negative as found in previous TAD studies. There were also indications of a more consistent association of highly curved legs in larger animals in this study. Reduced udder support was correlated with higher somatic cell scores, and greater body type scores were strongly associated with high yield, while higher yielding animals tended to have less desirable udders. The linear type traits were not correlated with lactation length except for a weak positive correlation with rump angle. Older animals with higher scores for stature, weight and body condition were submitted earlier, and the likelihood of early conception and pregnancy was most dependent on early calving and higher body condition score and was associated with reduced rump width. The suggestion was put forward that the number of linear type traits to be used in OAD systems can be reduced to include only one or two body type and one or two udder type traits, and the linear type traits to be considered for inclusion in the selection index for OAD milking systems are: stature/weight, udder support/fore udder attachment, body condition score, udder overall, and dairy conformation. Of these, udder support and stature appear to be the most suitable. In general, higher values for these traits would be desirable to improve yield and fertility in the case of the body type traits, and somatic cell score in the case of the udder type traits.

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LIST OF ABBREVIATIONS

BCS	Body condition score
C21	Conception to Day 21
C42	Conception to Day 42
F	Holstein-Friesian cows
F x J	Crossbred cows
J	Jersey cows
LIC	Livestock Improvement Corporation (New Zealand)
LL	Lactation length
MS/cow	Milksolids production per cow
MS/ha	Milksolids production per hectare
OAD	Once-a-day milking
S21	Submission to Day 21
S42	Submission to Day 42
SBCO	Interval from start of breeding to conception
SBFS	Interval from start of breeding to first service
SCS	Somatic cell score
TAD	Twice-a-day milking
TOP	Traits other than production